

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Application of

Atty. Docket

CYRIL ALLOUCHE

FR010003

Filed: CONCURRENTLY

FOLLOWING THE DEFORMATION OF A STRUCTURE PER UNIT LENGTH
DEFINED ON AN IMAGE OF A SEQUENCE OF IMAGES OF AN ORGAN WHICH
IS DEFORMABLE OVER TIME

Commissioner for Patents, Washington, D.C. 20231

PRELIMINARY AMENDMENT

Sir:

Prior to calculation of the filing fee and examination,
please amend the above-identified application as follows:

IN THE CLAIMS

Please amend the claims as follows:

3. An image processing method as claimed in claim 1,
wherein the structure per unit length defines a segmentation
of the image, said segmentation thus being followed from one
image to the other.
4. An image processing method as claimed in claim 1,
wherein the mathematical expression of the deformation of the
organ or part of the organ observed between the two images is
determined for a surface including the structure per unit
length from positions on the two images of a set of marking
points, said set of marking points containing at least the

marking points present on said surface.

5. An image processing method as claimed in claim 1, wherein the mathematical expression of the deformation of the organ or part of the organ observed between the two images is determined solely for the points on the structure per unit length from positions on the two images of a set of marking points, said marking points being weighted according to their distance with respect to the structure per unit length.

6. An image processing method as claimed in claim 1, including a step of determining one or more global movements of the structure per unit length, said global movements being extracted from the mathematical expression of the deformation and a step of subtraction of these global movements from the mathematical expression of the deformation applied to the structure per unit length.

9. Image processing device as claimed in claim 7.

10. Image processing device comprising means for iterating the method described for two images, successive or not, in Claim 1, on all the successive images in the image sequence.

11. Image processing device as claimed in claim 7, comprising a step of determining one or more global movements

of the structure per unit length, said global movements being extracted from the mathematical expression of the deformation and a step of subtracting these global movements from the mathematical expression of the deformation applied to the structure per unit length.

12. Image processing device as claimed in claim 7, comprising means of displaying the changes in the parameters of the deformation undergone by the structure per unit length during the sequence.

13. Image processing device as claimed in claim 7, wherein said structure per unit length is a structure per unit length defined by the user on one of the images in the sequence and in that the deformation is followed on all the images in the sequence.

14. Magnetic resonance image capture apparatus comprising:

- means of acquiring magnetic resonance images for obtaining a sequence of images,
- means for the visual presentation of these images,
- and
- image processing equipment as claimed in claim 7.

15. Computer program product comprising

portions/means/instructions of program code for processing steps of the method according to when the program is executed on a computer.

REMARKS

The foregoing amendments to claims were made solely to avoid filing the claim in the multiple dependent form so as to avoid the additional filing fee.

The claims were not amended in order to address issues of patentability and Applicant respectfully reserves all rights he/she may have under the Doctrine of Equivalents. Applicant furthermore reserves her right to reintroduce subject matter deleted herein at a later time during the prosecution of this application or continuing applications.

Respectfully submitted,

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APPENDIX

3. An image processing method as claimed in ~~one of~~
~~claims 1 or 2~~, characterized in that claim 1, wherein the
structure per unit length defines a segmentation of the
image, said segmentation thus being followed from one image
to the other.

4. An image processing method as claimed in ~~one of~~
~~claims 1 to 3~~, characterized in that claim 1, wherein the
mathematical expression of the deformation of the organ or
part of the organ observed between the two images is
determined for a surface including the structure per unit
length from positions on the two images of a set of marking
points, said set of marking points containing at least the
marking points present on said surface.

5. An image processing method as claimed in ~~one of~~
~~claims 1 to 3~~, characterized in that claim 1, wherein the
mathematical expression of the deformation of the organ or
part of the organ observed between the two images is
determined solely for the points on the structure per unit
length from positions on the two images of a set of marking
points, said marking points being weighted according to their
distance with respect to the structure per unit length.

6. An image processing method as claimed in ~~one of~~

claims ~~1 to 5~~ claim 1, including a step of determining one or more global movements of the structure per unit length, said global movements being extracted from the mathematical expression of the deformation and a step of subtraction of these global movements from the mathematical expression of the deformation applied to the structure per unit length.

9. Image processing device as claimed in ~~one of claims 7 and 8~~ claim 7, for implementing a method as claimed in one of Claims ~~3 to 6~~.

10. Image processing device as ~~claimed in one of claims 7 to 9~~, comprising means for iterating the method described for two images, successive or not, in Claim 1, on all the successive images in the image sequence.

11. Image processing device as claimed in ~~one of claims 7 to 10~~ claim 7, comprising a step of determining one or more global movements of the structure per unit length, said global movements being extracted from the mathematical expression of the deformation and a step of subtracting these global movements from the mathematical expression of the deformation applied to the structure per unit length.

12. Image processing device as claimed in ~~one of claims 7 to 11~~ claim 7, comprising means of displaying the changes in the parameters of the deformation undergone by the

structure per unit length during the sequence.

13. Image processing device as claimed in ~~one of claims 7 to 12~~, characterized in that claim 7, wherein said structure per unit length is a structure per unit length defined by the user on one of the images in the sequence and in that the deformation is followed on all the images in the sequence.

14. Magnetic resonance image capture apparatus comprising:

- means of acquiring magnetic resonance images for obtaining a sequence of images,
- means for the visual presentation of these images, and
- image processing equipment as claimed in ~~one of Claims 7 to 13~~ claim 7.

15. Computer program product comprising portions/means/instructions of program code for processing steps of the method according to ~~claims 1 to 5~~ when the program is executed on a computer.